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Job No.: CTCE/BBMP/W.No.07/MP/WMM/S-T/2014-15 02.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	02.06.2014

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Result : Flakiness Index = **11.85%**

Elongation Index = **13.23%**

Result : Combined Flakiness & Elongation index 25.08%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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QUALITY CONTROL REPORTS FOR

SEMI DENSE BITUMINOUS CONCRETE

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17.06.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	17.06.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	84	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

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17.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.06.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.82	22.02	21.92

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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17.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.06.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	98	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	291	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	25.19	22.82	**24.01**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 17.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 17.06.2014

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Result : Flakiness Index = **11.58%**

Elongation Index = **13.20%**

Result : Combined Flakiness & Elongation index **24.78%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 17.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 17.06.2014

Result : Flakiness Index = **12.35%**

Elongation Index = **13.23%**

Result : Combined Flakiness & Elongation index **25.58%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Stripping/2014-15 17.06.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.06.2014

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Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.40	96.60
2	3.4		
3	3.5		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Sp_Wa/2014-15

17.06.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	17.06.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2023	2024	2025	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1268	1269	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2019	2020	2022	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	752	
6	Weight of oven dried aggregate	W_4 g	2000	2008	2010	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.663	2.674	2.673	2.670
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.732	2.717	2.716	2.722
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.95%	0.60%	0.60%	0.71%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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17.06.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX AS per IRC:SP:-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
SAMPLE I/D	Roads in Venkategowda Layout in Ward No.07.
DATE OF TESTING	17.06.2014

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BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.00
7. Bitumen content in %	4.90	5.20
8. Average	**5.05**	

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Bit/2014-15

17.06.2014

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
SAMPLE I/D	Roads in Venkategowda Layout in Ward No.07.
DATE OF TESTING	17.06.2014

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GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.35	5.33	5.33	94.67	90-100
4.75	260.2	54.72	60.05	39.95	35-51
2.36	57.22	12.03	72.09	27.91	24-39
1.18	40.22	8.46	80.54	19.46	15-30
0.3	34.26	7.21	87.75	12.25	9-19
0.075	33.32	7.01	94.76	5.24	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	31.22	6.59	6.59	93.41	90-100
4.75	258.6	54.56	61.14	38.86	35-51
2.36	61.22	12.92	74.06	25.94	24-39
1.18	34.23	7.22	81.28	18.72	15-30
0.3	32.26	6.81	88.09	11.91	9-19
0.075	27.23	5.74	93.83	6.17	3-8

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Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Venkategowda Layout Kempapura 1st A Main in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/503/2013-14 Dated: 24.02.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	17.06.2014

Total Weight of Sample: **5150** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	355	6.9	6.89	93.11	90-100	
4.75	2610	50.7	57.57	42.43	35-51	
2.36	625	12.1	69.71	30.29	24-39	
1.18	455	8.8	78.54	21.46	15-30	
0.3	360	7.0	85.53	14.47	9-19	
0.075	390	7.6	93.11	6.89	3-8	

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	365	7.0	6.95	93.05	90-100	
4.75	2590	49.3	56.29	43.71	35-51	
2.36	890	17.0	73.24	26.76	24-39	
1.18	455	8.7	81.90	18.10	15-30	
0.3	390	7.4	89.33	10.67	9-19	
0.075	410	7.8	97.14	2.86	3-8	

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